

Remarks:

This amendment is responsive to the Office action dated June 22, 2006, and is being filed under 37 C.F.R. § 1.111. Claims 1-30 are pending in the application. In the Office action, the Examiner (1) rejected claims 1-13, 15-23, 27, and 28 under 35 U.S.C. § 102 or § 103 as being anticipated by or obvious over one or more cited references; and (2) objected to claims 14, 24-26, 29, and 30, indicating that these claims would be allowable if rewritten in independent form. Applicant traverses the rejections, contending that each of the pending claims is patentable over the cited references.

Nevertheless, to expedite the issuance of a patent, to more particularly point out and distinctly claim aspects of the invention that applicant would like to patent now, and to improve clarity, applicant has (1) canceled claims 3, 9, and 27-30, without prejudice; (2) amended claims 1, 6, 11, 15, 17, and 19-23; and (3) added three new claims, namely, claims 31-33, which correspond, respectively, to objected-to claims 26, 29, and 30. Applicant reserves the right to pursue the canceled claims, in original or amended form, at a later time. Furthermore, applicant has presented arguments showing that claims 1, 2, 4-8, 10-26, and 31-33 are patentable over the cited references. Accordingly, in view of the foregoing amendments and the following remarks, applicant respectfully requests reconsideration of the application under 37 C.F.R. § 1.111 and allowance of the pending claims.

Page 11 - AMENDMENT
Serial No. 10/796,757
HP Docket No. 200311688-1
KH Docket No. HPC 3E4

I. **Claim Rejections - 35 U.S.C. §§102 and 103**

The Examiner rejected claims 1-30 as being anticipated or obvious. Claims 1, 3, 4, 11-13, 15, 16, and 18-20 were rejected under 35 U.S.C. § 102(b) as being anticipated by U.S. Patent No. 6,130,685 to Matsubara et al. ("Matsubara"). In addition, claims 2 and 5-10 were rejected under 35 U.S.C. § 103(a) as being unpatentable over Matsubara in view of U.S. Patent No. 6,665,094 to Lapstun ("Lapstun"). Furthermore, claims 17, 21-23, 27, and 28 were rejected under 35 U.S.C. § 103(a) as being unpatentable over Matsubara in view of U.S. Patent No. 6,089,697 to Tajika et al. ("Tajika"). Applicant traverses the rejections, contending that the claims are patentable over the cited references.

Nevertheless, applicant has amended the claims for the reasons set forth above. Applicant has (1) canceled claims 3, 9, and 27-30, without prejudice; and (2) amended independent claims 1, 6, 19, and 20 to recite "selecting a bi-directional print mode or a uni-directional print mode," and independent claim 21 to replace "non-white" with "printed" and "white" with "non-printed." In addition, applicant has introduced a clarifying amendment into each of independent claims 1, 6, 11, 15, 19, and 20, namely, replacement of "at least one of the array and one or more portions of the array" with "(a) the array, (b) one or more portions of the array, (c) or both." This clarifying amendment is intended to improve the clarity of each of these claims without altering claim scope. Furthermore, applicant has amended dependent claims 17, 22, and 23 to correct a typographical error (claim 17) or to address formal issues created by the amendment of

independent claim 21 (claims 22 and 23). The rejected claims, as amended, are patentable over the cited references at least for the reasons set forth below.

A. Claims 1, 2, 4, and 5

Independent claim 1, as amended, is directed to a method of printing:

1. (Currently Amended) A method of printing, comprising:

receiving print data defining an arrangement of a first set of image elements within an array of first and second sets of image elements, the first set having a different color characteristic than the second set;

selecting a bi-directional print mode or a uni-directional print mode at ~~least one~~ mode for placement of colorant-based representations of the image elements of the first set onto a print medium based on one or more values corresponding to the percentage of image elements of the first set in ~~at least one~~ of (a) the array, [and] (b) one or more portions of the array, (c) or both; and

placing the colorant-based representations onto the print medium according to the print ~~at least one~~ mode selected and in the arrangement defined by the print data.

Claim 1 is patentable over the cited references, taken alone or in combination, because the cited references do not teach or suggest every element of amended claim 1. For example, the cited references (Matsubara, Tajika, and Lapstun) do not teach or suggest receiving print data defining an arrangement of a first set of image elements having a different color characteristic than a second set of image elements in an array, and "selecting a bi-directional print mode or a uni-directional print mode" for colorant placement "based on one or more values corresponding to the percentage of image elements of the first set."

Matsubara relates to a method for recording an image with multiple scanning of a recording head. The directional mode of the multiple scans is disclosed to be determined by a "media selector" (col. 19, lines 42-56). More particularly, Matsubara discloses manual operation of a media selector according to the type of paper used as a recording sheet. A bi-directional print mode is selected for a standard or "normal" sheet of paper (col. 19, lines 57-61). A one-directional print mode is selected for "special-purpose" paper, for example, coated paper (col. 19, lines 42-46). However, Matsubara does not teach or suggest selecting a bi-directional print mode or a uni-directional print mode according to the print data, and particularly not "based on one or more values corresponding to the percentage of image elements of the first set," as recited, in part, by claim 1.

In the Office action, the Examiner apparently agreed with this conclusion, stating that Matsubara does not teach selection of a bi-lateral or uni-lateral printing mode (Office action, page 10, lines 5-7). However, the Examiner asserted that selection of a bi-lateral or uni-lateral printing mode is well known in the art, and cited Tajika to support this assertion.

Tajika relates to an inkjet printing system that involves uni-directional and bi-directional print modes. In particular, Tajika discloses selection of a uni-directional print mode or a bi-directional print mode according to printing speed/quality and resolution (col. 25, lines 5-21 and Figure 24). For example, Tajika discloses bi-directional printing for higher speed and lower quality and/or lower resolution (namely, 360x360 dpi, or 720x720 dpi with only two passes) and uni-directional printing for higher quality and

Page 14 - AMENDMENT
Serial No. 10/796,757
HP Docket No. 200311688-1
KH Docket No. HPC 3E4

higher resolution (namely, 720x720 dpi with four passes). However, Tajika does not teach or suggest selection of a bi-directional print mode or a uni-directional print mode based on any value corresponding to a percentage, and particularly not "based on one or more values corresponding to the percentage of image elements of the first set," as recited, in part, by claim 1.

Lapstun relates to a page delivery architecture using contone data and bi-level data. However, Lapstun does not teach or suggest selection of a bi-directional print mode or a uni-directional print mode, and particularly not "based on one or more values corresponding to the percentage of image elements of the first set," as recited, in part, by claim 1.

In summary, none of the cited references, taken alone or in combination, teaches or suggests every element of amended independent claim 1. Claim 1 thus should be allowed. Claims 2, 4, and 5, which depend from claim 1, also should be allowed for at least the same reasons as claim 1.

B. Claims 6-8 and 10

Independent claim 6, as amended, is directed to a method of printing:

6. (Currently Amended) A method of printing, comprising:
receiving print data defining an arrangement of a first set of contone image elements within an array of first and second sets of contone image elements, the first set having a different color characteristic than the second set;
selecting a bi-directional print mode or a uni-directional print mode ~~an order~~ for placing colorant-based representations of the first set of contone image elements onto a print medium based on one or more values corresponding to the percentage of contone image elements of the first set in ~~at~~

least one of (a) the array, [[and]] (b) one or more portions of the array, (c) or both; and

placing the colorant-based representations onto the print medium according to the print mode order selected and in the arrangement.

Claim 6 is patentable over the cited references, taken alone or in combination, because the cited references do not teach or suggest every element of amended claim 6. For example, and for the same reasons as those described above in relation to claim 1, the cited references do not teach or suggest receiving print data defining an arrangement of a first set of contone image elements having a different color characteristic than a second set of contone image elements in an array, and "selecting a bi-directional print mode or a uni-directional print mode" for colorant placement "based on one or more values corresponding to the percentage of contone image elements of the first set." Claim 6 thus should be allowed. Claims 7, 8, and 10, which depend from claim 6, also should be allowed for least the same reasons as claim 6.

C. Claims 11-14

Independent claim 11, as amended, is directed to a method of printing:

11. (Currently Amended) A method of printing, comprising:

receiving print data defining an arrangement of a first set of image elements in an array of first and second sets of image elements, the first set having a different color characteristic than the second set;

determining one or more values corresponding to the percentage of image elements of the first set in at least one of (a) the array, [[and]] (b) one or more portions of the array, (c) or both;

selecting a direction for each of a plurality of passes of one or more printheads in relation to a print medium based on the one or more values; and

Page 16 - AMENDMENT
Serial No. 10/796,757
HP Docket No. 200311688-1
KH Docket No. HPC 3E4

delivering at least one colorant to the print medium during each of the plurality of passes and in the direction selected for each pass to create colorant-based representations of the image elements of the first set disposed in the arrangement.

Claim 11 is patentable over the cited references, taken alone or in combination, because the cited references do not teach or suggest every element of amended claim 11. For example, and for the same reasons as those described above in relation to claim 1, the cited references do not teach or suggest receiving print data defining an arrangement of a first set of image elements having a different color characteristic than a second set of image elements in an array, and "selecting a direction for each of a plurality of passes of one or more printheads," with selection based on one or more values corresponding to the percentage of image elements of the first set. Claim 11 thus should be allowed. Claims 12-14, which depend from claim 11, also should be allowed for least the same reasons as claim 11.

D. Claims 15-18

Independent claim 15, as amended, is directed to a printing system:

15. (Currently Amended) A printing system, comprising:

a data manipulation portion configured (1) to receive print data defining an arrangement of a first set of image elements in an array of first and second sets of image elements, the first set having a different color characteristic than the second set, (2) to determine one or more values corresponding to the percentage of image elements of the first set in ~~at least one of (a)~~ the array, ~~(b)~~ one or more portions of the array, ~~(c) or both~~, and (3) to select a direction for each of a plurality of passes in relation to a print medium based on the one or more values; and

Page 17 - AMENDMENT
Serial No. 10/796,757
HP Docket No. 200311688-1
KH Docket No. HPC 3E4

a colorant placement portion in communication with the data manipulation portion and including one or more printheads configured to deliver at least one colorant to the print medium as the printheads perform each of the plurality of passes in the direction selected for each pass to create colorant-based representations of the image elements of the first set disposed in the arrangement.

Claim 15 is patentable over the cited references, taken alone or in combination, because the cited references do not teach or suggest every element of amended claim 15. For example, and for the same reasons as those described above in relation to claim 1, the cited references do not teach or suggest a data manipulation portion configured to receive print data defining an arrangement of a first set of image elements having a different color characteristic than a second set of image elements in an array, and also configured "to select a direction for each of a plurality of passes," with selection based on one or more values corresponding to the percentage of image elements of the first set. Claim 15 thus should be allowed. Claims 16-18, which depend from claim 15, also should be allowed for least the same reasons as claim 15.

E. Claim 19

Independent claim 19, as amended, is directed to a program storage device:

19. (Currently Amended) A program storage device readable by a processor, tangibly embodying a program of instructions executable by the processor to perform a method of producing output, the method comprising:

receiving print data defining an arrangement of a first set of image elements within an array of first and second sets of image elements, the image elements of the first set having a different color characteristic than the image elements of the second set;

Page 18 - AMENDMENT
Serial No. 10/796,757
HP Docket No. 200311688-1
KH Docket No. HPC 3E4

selecting a bi-directional print mode or a uni-directional print mode ~~one or more modes~~ for placement of representations of the image elements of the first set relative to a print medium based on one or more values corresponding to the percentage of image elements of the first set in ~~at least one~~ of (a) the array, [(and)] (b) one or more portions of the array, (c) or both; and

placing the representations of the image elements of the first set relative to the print medium according to the print mode ~~one or more modes~~ selected and in the arrangement defined by the print data.

Claim 19 is patentable over the cited references, taken alone or in combination, because the cited references do not teach or suggest every element of amended claim 19. For example, and for the same reasons as those described above in relation to claim 1, the cited references do not teach or suggest receiving print data defining an arrangement of a first set of image elements having a different color characteristic than a second set of image elements in an array, and "selecting a bi-directional print mode or a uni-directional print mode" for placement of representations of the image elements "based on one or more values corresponding to the percentage of image elements of the first set." Claim 19 thus should be allowed.

F. Claim 20

Independent claim 20, as amended, is directed to a printing system:

20. (Currently Amended) A printing system, comprising:

means for receiving print data defining an arrangement of a first set of image elements within an array of first and second sets of image elements, the first set having a different color characteristic than the second set;

means for selecting a bi-directional print mode or a uni-directional print mode ~~at least one mode~~ for placement of colorant-based representations of the image elements of the first set onto a print medium based on one or more

Page 19 - AMENDMENT
Serial No. 10/796,757
HP Docket No. 200311688-1
KH Docket No. HPC 3E4

values corresponding to the percentage of image elements of the first set in at least one of (a) the array, (b) one or more portions of the array, (c) or both; and

means for placing the colorant-based representations onto the print medium according to the print at least one mode selected and in the arrangement defined by the print data.

Claim 20 is patentable over the cited references, taken alone or in combination, because the cited references do not teach or suggest every element of amended claim 20. For example, and for the same reasons as those described above in relation to claim 1, the cited references do not teach or suggest means for receiving print data defining an arrangement of a first set of image elements having a different color characteristic than a second set of image elements in an array, and "means for selecting a bi-directional print mode or a uni-directional print mode" for placement of representations of the image elements "based on one or more values corresponding to the percentage of image elements of the first set." Claim 20 thus should be allowed.

G. Claims 21-26

Independent claim 21, as amended, is directed to a method to improve print speed:

21. (Currently Amended) A method to Improve the print speed of a printer having uni-directional and bi-directional print modes, comprising:
receiving print data defining non-white printed pixels and white non-
printed pixels;

determining one or more values corresponding to the percentage of non-
white printed pixels or white non-printed pixels included in one or more portions
of the print data;

selecting one of the a uni-directional print mode or a and the bi-directional print mode based on the one or more values; and printing the print data with the [[one]] print mode selected.

Claim 21 is patentable over the cited references, taken alone or in combination, because the cited references do not teach or suggest every element of amended claim 21. For example, and for the same reasons as those described above in relation to claim 1, the cited references do not teach or suggest receiving print data defining printed pixels and non-printed pixels, and "selecting a uni-directional print mode or a bi-directional print mode" for printing the print data based on one or more values corresponding to the percentage of printed pixels or non-printed pixels. Accordingly, claim 21 should be allowed. Claims 22-26, which depend from claim 21, also should be allowed for at least the same reasons as claim 21.

II. New Claims

The Examiner merely objected to dependent claims 26, 29, and 30 in the Office action, stating that each of these claims would be allowable if amended to independent form. In response, applicant has added new claims 31-33, which correspond to objected-to claims 26, 29, and 30, respectively, as indicated in the following table:

New Claim	Support
31 (Independent)	Claims 21+26
32 (Independent)	Claims 21+29
33	Claim 30

Each of new claims 31-33 should be allowed for corresponding to an objected-to claim.

Page 21 - AMENDMENT
Serial No. 10/796,757
HP Docket No. 200311688-1
KH Docket No. HPC 3E4

III. Conclusion

Applicant believes that this application is now in condition for allowance, in view of the above amendments and remarks. Accordingly, applicant respectfully requests that the Examiner issue a Notice of Allowability covering the pending claims. If the Examiner has any questions, or if a telephone interview would in any way advance prosecution of the application, please contact the undersigned attorney of record.

Respectfully submitted,

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CERTIFICATE OF FACSIMILE TRANSMISSION

I hereby certify that this correspondence is being facsimile transmitted to Examiner L. Nguyen, Group Art Unit 2861, Assistant Commissioner for Patents, at facsimile number (571) 273-8300 on September 22, 2006.

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Page 22 - AMENDMENT
Serial No. 10/796,757
HP Docket No. 200311688-1
KH Docket No. HPC 3E4